CLAIMS:

1. An ultrasonic transmitting and receiving apparatus comprising:

an ultrasonic transducer array including plural ultrasonic transducers for transmitting ultrasonic waves and receiving ultrasonic waves reflected from an object to be inspected;

drive signal generating means for generating drive signals for respectively driving said plural ultrasonic transducers;

transmission control means for controlling said drive signal generating means such that ultrasonic waves to be transmitted from said plural ultrasonic transducers form a transmission beam to be transmitted in at least one sound ray direction;

reception control means for performing reception focusing processing on plural detection signals obtained based on ultrasonic waves received by said plural ultrasonic transducers so as to generate sound ray data representing ultrasonic information relating to said at least one sound ray direction;

storage means for storing plural kinds of filter coefficients related to plural sound ray directions, respectively; and

filter processing means for performing filter processing on the sound ray data generated by said reception control means by using filter coefficients related to said at least

one sound ray direction in which transmission and reception have been performed from among said plural kinds of filter coefficients.

2. An ultrasonic transmitting and receiving apparatus according to claim 1, wherein said plural kinds of filter coefficients are related to the plural sound ray directions, respectively, such that responses may become uniform in plural different regions included in an ultrasonic image.

3. An ultrasonic transmitting and receiving apparatus according to claim 1, wherein said filter processing means performs filter processing on the sound ray data generated by said reception control means by using different filter coefficients in accordance with spatial frequency components thereof.

4. An ultrasonic transmitting and receiving apparatus according to claim 1, wherein said filter processing means performs filter processing on said sound ray data by using different filter coefficients between a case of displaying a still image and a case of displaying a moving image.

5. An ultrasonic transmitting and receiving apparatus according to claim 1, wherein:

said storage means stores plural kinds of filter coefficients related to the plural sound ray directions and distances from said ultrasonic transducer array; and

said filter processing means performs filter processing on data relating to a region included in said sound ray data by using filter coefficients related to said at least one

sound ray direction in which transmission and reception have been performed and a distance between said ultrasonic transducer array and the region.

6. An ultrasonic transmitting and receiving apparatus according to claim 5, wherein said plural kinds of filter coefficients are related to the plural sound ray directions and distances from said ultrasonic transducer array such that responses may become uniform in plural different regions included in an ultrasonic image.

7. An ultrasonic transmitting and receiving apparatus according to claim 5, wherein said filter processing means performs filter processing on the sound ray data generated by said reception control means by using different filter coefficients in accordance with spatial frequency components thereof.

8. An ultrasonic transmitting and receiving apparatus according to claim 5, wherein said filter processing means performs filter processing on said sound ray data by using different filter coefficients between a case of displaying a still image and a case of displaying a moving image.

9. An ultrasonic transmitting and receiving apparatus according to claim 1, wherein:

said storage means stores plural kinds of filter coefficients related to the plural sound ray directions and plural parts of the object; and

said filter processing means performs filter processing on said sound ray data by using filter coefficients related

to said at least one sound ray direction in which transmission and reception have been performed and a part within the object as a target of imaging.

10. An ultrasonic transmitting and receiving apparatus according to claim 9, wherein said plural kinds of filter coefficients are related to the plural sound ray directions and the plural parts of the object, respectively, such that responses may become uniform in plural different regions included in an ultrasonic image.

11. An ultrasonic transmitting and receiving apparatus according to claim 9, wherein said filter processing means performs filter processing on the sound ray data generated by said reception control means by using different filter coefficients in accordance with spatial frequency components thereof.

12. An ultrasonic transmitting and receiving apparatus according to claim 9, wherein said filter processing means performs filter processing on said sound ray data by using different filter coefficients between a case of displaying a still image and a case of displaying a moving image.

13. An ultrasonic transmitting and receiving apparatus according to claim 1, wherein:

said storage means stores plural kinds of filter coefficients related to the plural sound ray directions, distances from said ultrasonic transducer array, and plural parts of the object; and

said filter processing means performs filter processing

on data relating to a region included in said sound ray data by using filter coefficients related to said at least one sound ray direction in which transmission and reception have been performed, a distance between said ultrasonic transducer array and the region, and a part within the object as a target of imaging.

14. An ultrasonic transmitting and receiving apparatus according to claim 13, wherein:

said plural kinds of filter coefficients are related to the plural sound ray directions, distances from said ultrasonic transducer array, and plural regions of the object such that responses may become uniform in plural different regions included in an ultrasonic image.

15. An ultrasonic transmitting and receiving apparatus according to claim 13, wherein said filter processing means performs filter processing on the sound ray data generated by said reception control means by using different filter coefficients in accordance with spatial frequency components thereof.

16. An ultrasonic transmitting and receiving apparatus according to claim 13, wherein said filter processing means performs filter processing on said sound ray data by using different filter coefficients between a case of displaying a still image and a case of displaying a moving image.